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09/974,582	10/09/2001	Ming-Chung Liang	JCLA7521	8295

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EXAMINER

VINH, LAN

ART UNIT PAPER NUMBER

1765

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/974,582

Applicant(s)

LIANG, MING-CHUNG

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/974582.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 3, 8, 9, 20 are objected for the use of improper Markush language. The examiner suggests replacing the term "a group" with --the group--

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 4, are rejected under 35 U.S.C. 102(e) as being anticipated by Li et al (US 6,168,726)

Li discloses a process for etching an oxidized-silane film. This process comprises the steps of:

providing a substrate having a silicon-based layer 96 formed thereon in an oxide etch chamber (col 7, lines 23-34, col 8, lines 2-4)

etching the layer 96 using a plasma etching gas, the plasma etching gas comprising C₄F₈/claimed fluoro-alkane gas (col 11, lines 63-64, table 8), adding nitrogen gas to the etching gas (col 12, lines 66-67)

The limitation of claim 3 has been discussed above.

Regarding claim 4, Li discloses using argon in the etching step (table 10)

4. Claims 18, 20, 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Li et al (US 6,168,726)

Li discloses a process for etching an oxidized-silane film. This process comprises the steps of:

providing a dual damascene structure inherently having a silicon substrate 90 (see prio art of record for evidence of this basis), the substrate 90 having an oxide layer 102, a photomask and photoresist layer formed thereon, the photoresist has a via/ opening (col 8, lines 26-56)

arranging the silicon substrate in an etching chamber/silicon oxide etching device (col 7, lines 23-34)

etching an opening 104 through the photomask layer, the oxide layer to expose the substrate using a plasma etching gas, the plasma etching gas comprising C₄F₈/claimed fluoro-alkane gas, adding nitrogen gas to the etching gas (col 8, lines 33-36, see abstract)

The limitation of claim 20 has been discussed above.

Regarding claim 21, Li discloses using argon in the etching step (table 10)

5. Claims 1, 3, 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al (US 6,083,790)

Lin discloses a method for making capacitor. This method comprises the steps of:

providing a substrate having a polysilicon 32 B layer formed thereon in an HDP etch chamber (col 5, lines 50-52, col 6, lines 4-5), which reads on providing a substrate having a silicon layer thereon in a silicon oxide etching device

etching the polysilicon layer/silicon layer 32B using a plasma etching gas, the plasma etching gas comprising CF_4 /claimed fluoro-alkane gas, nitrogen gas and argon gas (col 5, lines 66-67, col 6, lines 6-7)

The limitations of claims 3, 4 have been discussed above.

6. Claims 6, 8-11, 13, 15, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al (US 6,083,790)

Lin discloses a method for making capacitor. This method comprises the steps of:
providing a substrate having a polysilicon 32 B layer formed thereon in an HDP etch chamber (col 5, lines 50-52, col 6, lines 4-5), which reads on providing a substrate having a silicon layer thereon in a silicon oxide etching device

etching the polysilicon layer/silicon layer 32B using a plasma etching gas, the plasma etching gas comprising CF_4 /claimed fully fluoro-substitute alkane gas, CHF_3 /claimed partially fluoro-substitute alkane gas, nitrogen gas and argon gas (col 5, lines 66-67, col 6, lines 6-7)

The limitations of claims 8, 9, 10, 13, 16 have been discussed above

Regarding claims 11, 15, Lin discloses the plasma etching gas mixture $CHF_3/CF_4/Ar/N_2$ having a proportion of 9:3:8:2.5 (col 6, lines 6-7), which reads on a ratio of CHF_3 to CF_4 is about 3/1

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2, 5, 7, 12, 14, 17, 19, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6,083,790) in view of Guinn et al (US 5,877,032)

Lin's method has been described above, Unlike the instant claimed inventions as per claims 2, 5, 7, 12, 14, 17, 19, 22, Lin does not disclose the specific flow rates of the nitrogen gas and the argon gas although Lin discloses adjusting the flow rate of the gases to achieve the mixing ratio of the gases.

However, Guinn, in a method for plasma etching, discloses that a processing parameter such as gas flow rate can be varied to change the etch rate (col 4, lines 3-6)

Hence, one skilled in the art would have found it obvious to modify Lin by adjusting the flow rate of the nitrogen and argon gas to discover the selected/optimum values for the flow rate in order to obtain traces over a range of etch rate as taught by Guinn (col 4, lines 6-11)

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McTeer (US 6,204,179) discloses that a dual damascene structure has a silicon substrate (col 18, lines 28-29)

Response to Arguments

10. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

October 16, 2003